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1-9-2 Marunouchi, Chiyoda-Ku
Tokyo 100-6620
JAPON

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Y.REF.: OSP 19905

O.REF.: **SR 29151 JP/HM**
S 2512 HM/dm

RE : European Patent Application
N° 05 758 318.9-2225 / 1768102
Corresponding to PCT/JP2005012667

Applicant(s) : Nippon Telegraph and Telephone Corporation

Title: "SOUND SIGNAL DETECTION SYSTEM, SOUND SIGNAL DETECTION SERVER, IMAGE SIGNAL SEARCH APPARATUS, IMAGE SIGNAL SEARCH METHOD, IMAGE SIGNAL SEARCH PROGRAM AND MEDIUM, SIGNAL SEARCH APPARATUS, SIGNAL SEARCH METHOD AND SIGNAL SEARCH PROGRAM AND MEDIUM"

EXTENDED SUPPLEMENTARY EUROPEAN SEARCH REPORT

Dear Sirs,

With regard to the patent application cited above, we have just received the supplementary European search report and the European search opinion issued by the European Patent Office. You will find enclosed a copy of these documents.

According to the European Patent Office, the application does not comply with the requirements of clarity and conciseness since it contains 3 independent apparatus claims 1, 2 and 4.

As indicated in the enclosed communication, an examination for novelty and inventive step for claims 2 and 4, in addition to claim 1 and 3, has been carried out as a service to the applicant.

In the present case, the search opinion is negative with regard to the independent claims 1-4. Should you wish to receive our analysis of this opinion, please let us know as soon as possible.

Please note that during the examination, the European Patent Office will issue a first communication on patentability. In this respect, it is possible to traverse the negative statement in order to obtain a first communication whose content differs from the one of the opinion by replying to the opinion at the same time as the confirmation of further proceeding with the application.

3, RUE DU DOCTEUR LANCEREAUX
75008 PARIS
TÉL : 33 (0)1 53 83 94 00
FAX : 33 (0)1 45 63 83 33

34 BOULEVARD DE L'EMBOUCHURE
31000 TOULOUSE
TEL : 33 (0)5 34 40 73 30
FAX : 33 (0)5 34 40 73 31

22 AVENUE DOYEN LOUIS WEIL - BP 1519
38025 GRENOBLE CEDEX 1
TÉL. 33 (0)4 38 21 06 10
FAX. 33 (0)4 38 21 06 11

www.brevalex.com
brevets.patents@brevalex.com
marques.trademarks@brevalex.com

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SARL AU CAPITAL DE 1 080 000 EUROS - RCS PARIS 305332637 - TVA N° FR 54305332637
BNP PARIS PLACE VENDÔME - N° DE COMPTE : 21149970

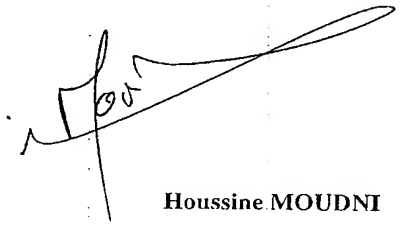
Y/Ref. : OSP 19905
O/Ref. : SR 29151 JP/HM
N° of the application : 05 758 318.9-2225

In this regard, a request for examination has been filed prior to the transmission of the European supplementary search report. Thus, an invitation will be issued soon by the European Patent Office for the applicant to indicate whether he desires to proceed further with the European patent application.

We will transmit this invitation as soon as we receive it.

We take the opportunity to join our debit note regarding the present transmission.

Yours faithfully,



Houssine MOUDNI

Encl. : Search report
Search opinion
Cited document(s)
Debit note

Europäisches Patentamt
European Patent Office
Office européen des brevets

European Patent Office
80298 MUNICH
GERMANY
Tel. +49 (0)89 2399 - 0
Fax +49 (0)89 2399 - 4465

Poulin, Gérard
BREVALEX
3, rue du Docteur Lancereaux
75008 Paris
FRANCE

For any questions about this communication:
Tel.:+31 (0)70 340 45 00

Date: 23.07.08

Reference	Application No./Patent No.
SR 29151 JP/HM	05758318.9 - 2225 / 1768102 PCT/JP2005012667

Applicant/Proprietor: NIPPON TELEGRAPH AND TELEPHONE CORPORATION

Communication

The extended European search report is enclosed.

The extended European search report includes, pursuant to Rule 62 EPC, the supplementary European search report (Art. 153(7) EPC) and the European search opinion.

Copies of documents cited in the European search report are attached.

☑ 1 additional set(s) of copies of such documents is (are) enclosed as well.

Refund of the search fee

If applicable under Article 9 Rules relating to fees, a separate communication from the Receiving Section on the refund of the search fee will be sent later.

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European Patent Office

SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application Number
EP 05 75 8318

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	KUROZUMI T ET AL: "A robust audio searching method for cellular-phone-based music information retrieval" PATTERN RECOGNITION, 2002. PROCEEDINGS. 16TH INTERNATIONAL CONFERENCE ON QUEBEC CITY, QUE., CANADA 11-15 AUG. 2002, LOS ALAMITOS, CA, USA,IEEE COMPUT. SOC, US, vol. 3, 11 August 2002 (2002-08-11), pages 991-994, XP010613790 ISBN: 978-0-7695-1695-0 * abstract * * figure 1 * * page 991, left-hand column, paragraph 1 - right-hand column, paragraph 1 * * page 991, right-hand column, last paragraph * * page 992, section 2.1, "Feature extraction" * * page 992, section 2.2, "Local time-frequency-region normalization" * * page 992, section 2.3, "Robust subspace spanning" *	1-12, 20-25, 28,29	INV. G06F17/30 G10H1/00 G10L15/10
Y		13-19, 26,27, 30-36	TECHNICAL FIELDS SEARCHED (IPC) G06F G10H G10L G06K

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The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search	Date of completion of the search	Examiner
Munich	15 July 2008	Chétry, Nicolas

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C04)

European Patent Office

SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application Number
EP 05 75 8318

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	KASHINO K ET AL: "Feature fluctuation absorption for a quick audio retrieval from long recordings" PATTERN RECOGNITION, 2000. PROCEEDINGS. 15TH INTERNATIONAL CONFERENCE ON SEPTEMBER 3-7, 2000; [PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON PATTERN RECOGNITION. (ICPR)], LOS ALAMITOS, CA, USA,IEEE COMPUT. SOC, US, vol. 3, 3 September 2000 (2000-09-03), pages 98-101, XP010533238 ISBN: 978-0-7695-0750-7 * abstract * * page 98, left-hand column, paragraph 1 * * page 98, right-hand column, last paragraph *	13-19, 26,27, 30-36	
A		1-12, 20-25, 28,29	
A	US 2001/049664 A1 (KASHINO KUNIO [JP] ET AL) 6 December 2001 (2001-12-06) * figures 1,2 * * paragraph [0002] * * paragraph [0011] * * paragraph [0038] - paragraph [0081] *	1-36	TECHNICAL FIELDS SEARCHED (IPC)
A	US 5 210 820 A (KENYON STEPHEN C [US]) 11 May 1993 (1993-05-11) * figure 8 * * column 1, line 5 - line 11 * * column 4, line 31 - column 5, line 59 *	1-4, 13-19, 26,27, 30-36	

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The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search	Date of completion of the search	Examiner
Munich	15 July 2008	Chétry, Nicolas

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X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

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EPO FORM 1503 03.82 (P04C04)

European Patent Office

SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application Number
EP 05 75 8318

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 5 097 520 A (BESSHO GOROH [JP] ET AL) 17 March 1992 (1992-03-17) * column 1, line 5 - line 9 * * column 2, line 30 - column 4, line 55 *	1-4, 13-19, 26,27, 30-36	

TECHNICAL FIELDS SEARCHED (IPC)

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search	Date of completion of the search	Examiner
Munich	15 July 2008	Chétry, Nicolas

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C04)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 05 75 8318

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

15-07-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2001049664 A1	06-12-2001	NONE	
US 5210820 A	11-05-1993	AT 142815 T	15-09-1996
		CA 2041754 A1	03-11-1991
		DE 69122017 D1	17-10-1996
		DE 69122017 T2	10-04-1997
		EP 0480010 A1	15-04-1992
		ES 2091328 T3	01-11-1996
		HK 133697 A	24-10-1997
		JP 5501166 T	04-03-1993
		JP 3130926 B2	31-01-2001
		WO 9117540 A1	14-11-1991
US 5097520 A	17-03-1992	DE 4001613 A1	23-08-1990

The examination is being carried out on the **following** application **documents**:

Description, Pages

1-102 filed with entry into the regional phase before the EPO

Claims, Numbers

1-36 filed with entry into the regional phase before the EPO

Drawings, Sheets

1/17-17/17 filed with entry into the regional phase before the EPO

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Reference is made to the following documents:

D1: **XP010613790**, Kurozumi T et AL, "A robust audio searching method for cellular-phone-based music information retrieval", Pattern Recognition, 2002. Proceedings. 16th International Conference, 15 Aug. 2002.

D2: **XP010533238**, Kashino K et AL, "Feature fluctuation absorption for a quick audio retrieval from long recordings", Pattern Recognition, 2000. Proceedings. 15th International Conference, 3 Sept. 2000.

*****

1. According to Art. 84 EPC, the claims shall be clear and concise. This objection about clarity also falls within the scope of Rule 43(2) EPC stipulating that the number of independent claims is limited to one independent claim in each category (see Guidelines, C-III, 3.2 and 3.3), unless for the cases falling within the scope of sub-paragraphs (a), (b) or (c) of this rule. Claims 1, 2, and 4 are all independent **apparatus** claims and they do not fall within the scope of the sub-paragraphs (a), (b) or (c) of Rule 43(2) EPC.

   Nevertheless, as a service to the applicant, an examination for novelly and inventive step for the claims 2 and 4, in addition to the claims 1 and 3, has been carried out.

2. The application does not meet the requirements of Art. 84 EPC, because the subject-matter of the set of independent **claims 1-4** is unclear. Indeed, in claim 1, the term "degenerating" is unclear as it does not have in this technical field any pre-assigned, generally accepted meaning (see Guidelines, C-III, 4.6). As a result, the definition of the subject-matter of said claim is rendered unclear and claim 1 does not fulfill the requirements of Art. 84 EPC. In the following, the term "degenerating" is interpreted in the light of the matter than can be found in the description, p. 36, fifth paragraph and reciting that "a degenerated vector is a calculated vector based on normalized features". Wherever appropriate, presumed amendments will be typed within square brackets in the citations of claim wordings later in this document. The same objections apply mutatis mutandis to claims 2-4 in which the term "degenerating" is used.

*****

3. The application does not meet the requirements of Art. 52(1) and Art. 54 EPC because the subject-matter of independent **claim 1** (and correspondingly **claims 2-4**) is not new.

3.1 Indeed, the document D1 discloses (the reference in parentheses apply to this document):

- "A signal detection system that searches for a part of a stored signal similar to a target signal (see abstract, lines 1-2, Fig. 1, p. 991, lhc, *Introduction*, first paragraph), comprising:

- a stored feature calculation portion that calculates a stored feature from the stored signal (see Fig. 1, p. 991, lhc, last paragraph, lines 4-6, "feature vectors are calculated from the stored signal");

- a target feature calculation portion that calculates a target feature from the target signal (see Fig. 1, p. 991, lhc, last paragraph, lines 6-8, "feature vectors are calculated from a given query signal"); and

- a feature comparison portion that calculates a degree of similarity using both a vector generated ~~by degenerating~~ [from] the [normalized] stored feature based on statistics of the stored feature calculated beforehand and a vector generated ~~by degenerating~~ [from] the [normalized] target feature based on statistics of the target

feature calculated beforehand (see Fig. 1, p. 991, from lhc, last paragraph, line 4 to p. 991, rhc, first paragraph, line 4. See also in p. 991, rhc, last paragraph, line 8 from bottom, how the "robust subspace spanning" technique is used to generate vectors from "local time-frequency region normalized feature vectors". See also the details about the normalisation procedure given in p. 992, section 2.2, *Local time-frequency-region normalization"* involving signal statistics and in particular the Eq. 2-4)."

As a result, the subject-matter of claim 1 is not novel.

3.2 The subject-matter of **claims 2-4** corresponds almost word for word to the subject-matter of claim 1. As a result, the same objections raised in point 2 apply mutatis mutandis and claims 2-4 are not novel.

*****

4. None of the dependent **claims 5-19** contains a feature which would cause a claim containing it to be novel or to involve an inventive step over the prior-art D1, the reason being as follows:

4.1 The subject-matter of **claim 5** recites that the "stored and target features" are calculated from "time-series data". This feature however is implicitly disclosed in D1 (see in p. 992, lhc, section 2.1, *Feature extraction,* how the "FFT-based short-time power spectrum", obtained from "time-series data", is used as feature). Claim 5 further recites that "two elements from the stored and target features corresponding to the statistics larger than a predetermined threshold are selected so as to obtain a stored and target areas respectively". However, this feature is also implicitly disclosed in D1. See D1, p. 991, rhc, line 3 from bottom, the use of the "robust subspace spanning" and the details given in p. 992, section 2.3, *Robust subspace spanning,* and in particular the mention of the PCA, "[...] our method is based on PCA", line 7. See also the notion of "subspace", in section 2.3, lines 1-3, which underlies the fact that some features with the highest relevance are selected from the original space and mapped to a subspace. Finally, claim 5 recites some additional steps about the "feature comparison portion" that are disclosed in D1 (see p. 991, from lhc, last paragraph, line 4 to p. 991, rhc, first paragraph, line 4). As a result, claim 5 is not novel.

4.2 The subject-matter of **claims 6-8** details various aspects of the procedure yielding to the calculation of the statistics that are used to select "the stored and target areas of

features". In particular, claim 6 recites features about the normalisation procedure. However, corresponding features have already been disclosed in D1 (see Eq. 2-4 in p. 992, rhc, for the details about the "calculation of the average value from neighbouring feature vector" as well as for the "subtraction of the average value from the elements"). As a result, claim 6 is not novel. Claims 7 and 8, on the other hand, propose two ways of "selecting relevant features from the feature data set" that do not involve an inventive step over the "PCA-based robust subspace spanning" technique disclosed in D1 (see point 4.1 above). Therefore, claims 7 and 8 lack inventive step.

4.3 **Claim 9** recites that the "sound signal detection system" claim 5 further comprises "a normalisation portion that calculates predetermined statistics from the stored and target features and neighbouring stored and target features". This is exactly what is performed in D1 (see abstract, line 7-8 and Eq. 2-4 in p. 992, rhc, for example). Therefore claim 9 is not novel.

4.4 The subject-matter of **claim 10** recites details about the architecture of the "sound signal detection system", and specifies in particular a client-server design in which. This is however exactly what is proposed in D1 (see D1, abstract, lines 2-3, as well as p. 991, lhc, first paragraph). As a result, claim 10 is not novel.

4.5 The subject-matter of **claim 13** introduces over D1 "a quantization step after the feature normalization", resulting in a reduction of the dimension of the feature data set prior to the calculation of the similarities. However, this feature has already been employed for the same purpose in a similar context (see D2, p. 98, lhc, first paragraph and p. 98, rhc, last paragraph, lines 3-4). Therefore, it would be obvious to the person skilled in the art, namely when the same result is to be achieved, to apply these features with corresponding effect to the technique according to document D1, thereby arriving at the subject-matter according to claim 13. As a result, the subject-matter of claim 13 does not involve an inventive step (Articles 52(1) and 56 EPC). **Claim 14** further precises that the "feature vector includes and element of a strength information per frequency sampled in a predetermined span" and that "the statistics are an average value and a dispersion of the feature vector". These features however are disclosed in D1 (see D1, section 2.1, *Feature extraction*, line 4-5, "[...] we simply use the FFT-based short-time power spectrum [...]" as well as Eq. 2-4, p. 992, rhc and p. 992, rhc, third paragraph, respectively) so that claim 14 lacks inventive step. The subject-matter of **claim 15** further recites that the "quantisation step" of claim 13 consists in a "feature binarisation" of the feature vectors. This

however is a standard and known procedure in the field of pattern matching so that claim 15 shall not be considered as involving an inventive step over D1. The subject-matter of **claim 16** recites that the "quantisation step" of claim 13 is a "vector quantising step" and further mentions some details about its implementation. These features correspond however to minor modifications of the "vector quantising" method proposed in D2 (see D2, p. 98, rhc, last paragraph, lines 1-4) and claim 16 lacks inventive step. Finally, **claim 17** corresponds word for word to the subject-matter of claim 10 which has been shown in point 4.4 above not to be inventive. As such, claim 17 lacks inventive step.

4.6 Dependent **claims 11 and 18** recites features related to the "signal detection server" of claim 2 that are no different than the features of claims 5 and 13 respectively which has been shown in points 4.1 and 4.5 above not to novel or inventive. As a result, claims 11 is not novel and claim 18 lacks inventive step.

4.7 The subject-matter of dependent "method" **claims 12 and 19** do not contain additional features which, in combination with the features of claim 3 to which they refer meet the requirements of Art. 52(1) and Art. 54 EPC or Art. 56 EPC with respect to novelty or inventivity. Indeed, the subject-matter of claims 12 and 19 corresponds to the "apparatus" claims 5 and 13 respectively. As a result, the same objections raised in points 4.1 and 4.5 apply and claim 12 is not novel and claim 19 lacks inventive step.

*****

5. None of the dependent "signal detection apparatus" **claims 30-36** contains a feature which would cause a claim containing it to involve an inventive step over the prior-art D1. Indeed, claims 30-34 recite similar subject-matters to the claims 5-19, using a similar wording. The only difference lies in that the matters specified by claims 30-34 are applicable to any type of signal (and thereof to "sound signal"). As a result, the same respective objections raised in point 4 above apply mutatis mutandis and claims 30-34 lack inventive step. Claims 35-36, on the other hand, specify non-inventive additional features to the matter of claim 30.

5.1 In particular, **claims 30 and 31** recite similar subject-matters to claim 13, further specifying that the "quantization is non-linear" (claim 30) and consists in using a "Voronoi tessellation", that is, a vector quantiser (claim 31). The inventivity of these features is objectionable using the same argumentation developed for claim 16 in

point 4.5 above. Therefore, claims 30 and 31 lack inventive step.

5.2 **Claim 32** recites that prior to the "nonlinear quantisation step for the target signal, elements corresponding to statistics larger than a predetermined threshold are selected". This feature is however no different than the one of claim 5 that has been shown in point 4.1 above not to be novel. Therefore claim 32 lacks inventive step.

5.3 The subject-matter of **claim 33** recites similar features than the one of claim 32 but for the "stored signal". As such, claim 33 does not involve an inventive step.

5.4 The subject-matter of the "signal search method" **claim 34** corresponds word for word to the subject-matter of the "signal search apparatus" claim 30 that has been shown in point 5.1 above not to involve an inventive step. As a result, claim 34 lacks inventive step.

5.5 Finally, **claims 35 and 36** comprise claims 30 and 35 that have been shown above not to involve an inventive step over D1. In addition, it is general knowledge in the field that an apparatus such as the one of D1 be implemented as a "program" that can be stored on a "computer readable medium". As a result, claims 35 and 36 lack inventive step.

*****

6. None of the dependent **claims 20-29** contains a feature which would cause a claim containing it to involve an inventive step over the prior-art D1.

6.1 Indeed, **claims 20-23**, on the one hand, and **claims 26-27**, on the other hand, apply the technique of claims 5-19 and 30-34 to the case of "image signals". However, none of the recited technical features of the above-mentioned claims are specific to a particular field, that is, sound or image processing. As a result, none of the dependent claims 20-23 and 26-27 can be regarded as involving an inventive step over D1.

6.2 The subject-matter of **claims 24-25 and 28-29** lack inventive step for the same reason mentioned in point 5.5 above.

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7. Following deficiencies having regard to the form of the content of the application have been observed:

7.1 According to the requirements of Rule 43(4) EPC, all dependent claims referring back to a single previous claim shall be grouped together to the extent and in the most appropriate way possible so as not to create obscurity in the definition of the subject-matter to be protected (see Guidelines, C-III, 3.5).

7.2 It is of the examiner opinion that one should read in p. 19 of the description that "Fig. 18 is a flowchart showing an example of operation of the signal search system shown in Fig. 15" instead of "Fig. 18 is a flowchart showing an example of operation of the signal search system shown in Fig. 11", in order to be consistent with the matter that can be found in p. 86, lines 2-3, in the description.

*****

8. The examiner is of the preliminary opinion that in view of the available prior-art and considering the objections raised above, it is not currently apparent which part of the application could serve as a basis for a new allowable set of claims.

Should the applicant nevertheless regards some particular matter as patentable, independent claims should be filed taking account of Rule 43(1) EPC. When filing amended claims the applicant should at the same time bring the description into conformity with the amended claims. However, care should be taken during revision, especially of the introductory portion and of any statements of problem or advantage, not to add subject-matter which extends beyond the content of the application as originally filed (Art. 123(2) EPC).

Finally, the attention of the applicant is put on the fact the amended claims shall not relate to unsearched subject-matter which does not combine with the originally claimed group of inventions to form a single general concept (Rule 137(4) EPC).

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